

(12) UK Patent Application (19) GB (11) 2 315 292 (13) A

(43) Date of A Publication 28.01.1998

(21) Application No 9714033.9

(22) Date of Filing 02.07.1997

(30) Priority Data

(31) 9614803

(32) 15.07.1996

(33) GB

(71) Applicant(s)

Caradon Everest Limited

(Incorporated in the United Kingdom)

Everest House, Sopers Road, Cuffley, POTTERS BAR,
Herts, EN6 4SG, United Kingdom

(72) Inventor(s)

Victor John McCarthy

(74) Agent and/or Address for Service

A A Thornton & Co
Northumberland House, 303-306 High Holborn,
LONDON, WC1V 7LE, United Kingdom

(51) INT CL⁶

E06B 3/72

(52) UK CL (Edition P)

E1J JGS

(56) Documents Cited

GB 2289700 A

GB 1406235 A

GB 0907088 A

EP 0726381 A1

EP 0074623 A2

WO 94/27021 A1

US 4752517 A

(58) Field of Search

UK CL (Edition O) E1J JGL JGS JGX JHX JM JXX

INT CL⁶ E06B 3/70 3/72 3/74 3/76 3/78 3/82 3/84 3/86
3/88

Online: World Patents Index

(54) Panel door having edge protection for the cut panels

(57) To accommodate substantial variations in the dimensions of door openings, a skinned or panel door (fig. 5) has a frame 4 defining recesses 5 for receiving a pair of door panels 1,2 of variable size. The recesses also define a projection wall 7 surrounding the free edges 8 of each panel 1,2 to protect the exposed free edge of particularly GRP panels from the ingress of water and the action of sunlight. In a further embodiment (fig. 3), a flange 9 may overlie the margin of the exterior face of each panel.

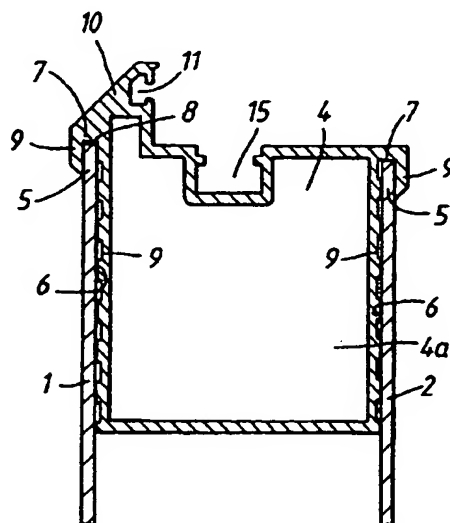


Fig.3

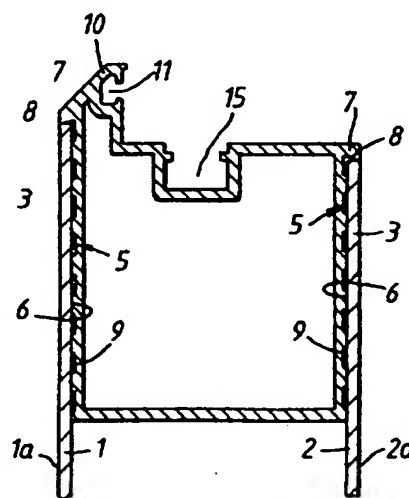


Fig.5

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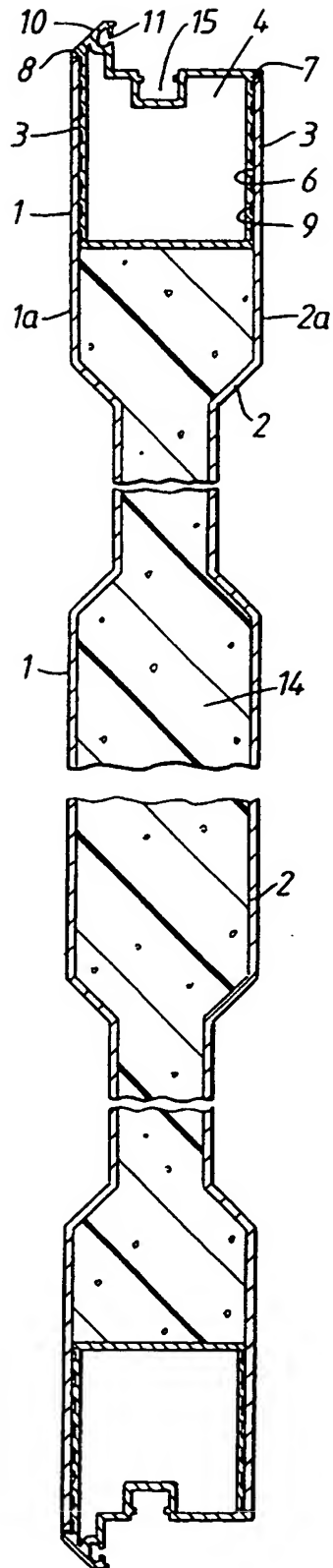


Fig.1

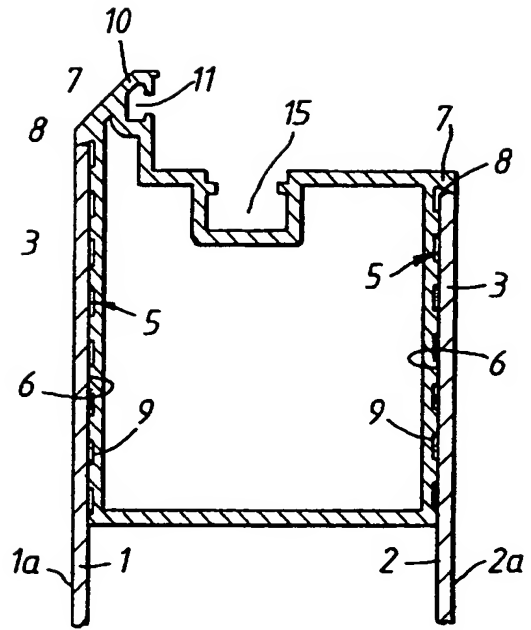


Fig.5

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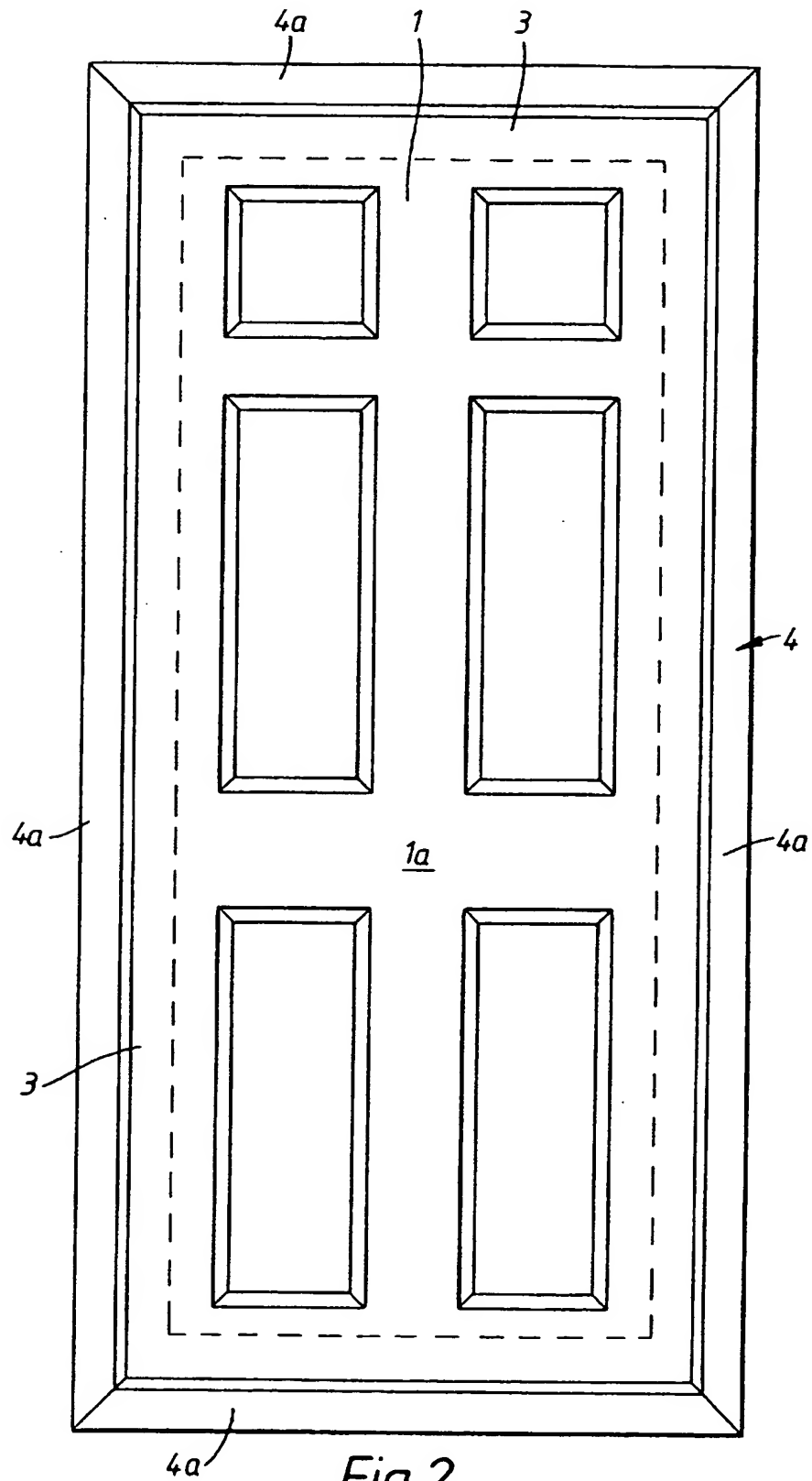


Fig. 2

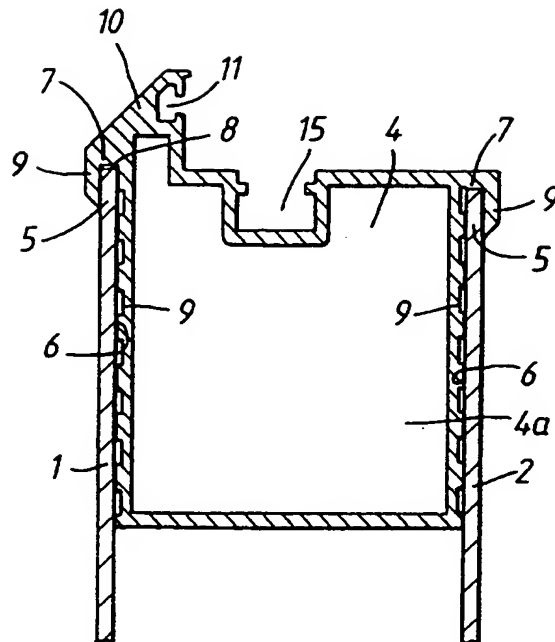


Fig.3

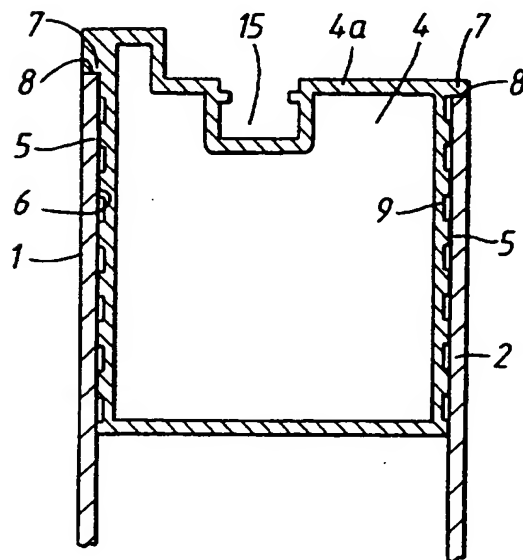


Fig.4

Improvements in and relating to doors

The present invention relates to doors and particularly but not exclusively to replacement and bespoke doors made mainly of materials other than wood.

A nonuniformity in door sizes means that, particularly with replacement or bespoke doors, there is a requirement to be able to provide a door with substantial variation in its dimensions. Previous attempts which have been made to provide such a protean door, e.g. by adjusting or cutting down a component of the door, have not enabled sufficient variation of dimensions. Also, where the component is made of a plastics material, particularly a glass reinforced plastics material, further problems are created by the need to protect the cut edge against ingress of water and the action of sunlight.

According, the present invention provides a door comprising a pair of rectangular panels arranged side-by-side to provide the two faces of the door, the panels being spaced apart with a circumjacent frame overlying the free edges of the panels, the space between the panels being filled with a material, the panels being fixed to the frame and the material, and each panel having integral planar edge portions which are designed to be reduced in width prior to assembly with the frame, thereby to enable construction of a variable size of door. The frame may define recesses in which the rectangular panels are received, each recess having a first surface which contacts the inner face of the respective panel and a projecting wall surrounding the first surface and which overlies the free edge of the respective panel to facilitate sealing of the free edge of the panel.

In the preferred embodiment, the space between the panels is filled with a foam material.

Preferably each panel is fixed to the frame by the first surface, for example using a bonding compound, e.g., an adhesive or solvent, and the bonding compound or a sealant may be provided between the free edge of the panel and the surface of the projecting wall to seal the free edge of the panel.

The projecting wall may be extended by a flange which overlies the exterior face of the panel to enclose the free edge of the panel. With this configuration, the frame of the door is assembled around the one or each panel, the one or each panel being positively retained or restrained by the flange, or the respective flanges, of the frame.

The panels may be moulded from a synthetic material such as glass fibre reinforced plastics, e.g. sheet moulding compound.

Advantageously, the frame, which may be made of wood, metal or plastics material, e.g. glass reinforced plastics, is made from an elongate member of uniform cross-section, which is cut to provide frame elements which extend along the four side edges of the door and which may be fixed together at the corners of the door.

The material filling the space between the panels may be provided in the form of a block or sheet which is shaped to fit the space between the panels and the frame and is placed between the panels and within the frame and then adhered or otherwise bonded or fixed to the panels and/or frame. Alternatively, and preferably, when the frame and panels have been assembled together, material is injected into the space between the panels. The interior faces of the panels may be configured to increase adhesion between the material and the panels. Where a foam is used it is preferably a structural foam and may be injected into the space between the panels and foamed in place under pressure.

Each panel is preferably moulded to have external surface

configurations representing those found in conventional wooden doors and is then provided with planar edge portions of a width such that they can be reduced and yet leave a sufficiently wide edge portion to aesthetically balance the configurations moulded into the panel.

Further features and advantages of the present will become apparent from the following description of embodiments thereof given by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a vertical section through an embodiment of door according to the present invention;

Figure 2 is a plan view of one face of the door of Figure 1;

Figure 3 is a part section similar to that of Figure 1 showing a second embodiment according to the present invention;

Figure 4 is a part section similar to that of Figure 1 showing a modification applicable to the embodiments of Figures 1 and 3; and

Figure 5 is an enlarged sectional view of an end of the door shown in Figure 1.

The door shown in Figures 1 and 2 comprises a pair of rectangular panels 1, 2 which are arranged side-by-side to provide the two exterior faces 1a, 2a of the door. The panels are moulded of glass fibre reinforced plastics, for example from sheet moulding compound and have planar edge portions 3 each extending around a central portion of the panel which may be configured to represent panelling arrangements found in conventional wooden door constructions. The edge portions 3 are dimensioned so that they can be reduced in width, i.e. edge strips can be cut off, thereby enabling the panel to be trimmed to fit different sizes of frames. For example, the edge portions 3 can be dimensioned so that a strip of up to about 50 mm in width can be removed from each edge with the remaining panel still being aesthetically acceptable.

The door also comprises a frame 4 which extends along the edges

of the door and to which the panels 1, 2 are fixed. The frame 4 comprises four frame elements 4a which are cut from a length of uniform cross-section of material to fit the door opening. The frame may be made of wood or aluminium but is preferably made from a plastics material such as PVC or glass reinforced plastics. The frame elements 4a may be joined at the corners and bonded together. The corners may be strengthened by the provision of additional means, for example internal brackets, which extends through the corners, or such additional means may be used in place of a bonding agent. Alternatively, if adhesion between the frame 4, the panels 1, 2, and the foam core is sufficiently strong, bonding or bracketing of the corners may be superfluous.

As shown in Figure 1, when the frame elements 4a are assembled to create the frame 4, the frame defines a recess 5 in each face, which recess is dimensioned to receive the respective panel 1 or 2. Each recess 5 is defined by a first surface 6 which underlies and contacts the interior face of the respective panel 1 or 2 and the panel is bonded to this surface, for example by use of an adhesive or a solvent. Surrounding each surface 6 is an upstanding wall 7 which overlies the free edge 8 of the respective panel to facilitate sealing of this edge. The bonding material or a sealant is used to seal the free edge 8 of the panel 1 or 2. Each surface 6 may be provided with grooves 9 to accommodate excess bonding material and each wall 7 may extend perpendicular to the adjacent surface 6 or may be undercut as shown in Figure 1 to provide additional space for bonding material or sealant in the region of the edge 8 of the panel.

Between the panels 1, 2 and within the frame 4, a material 14, e.g. structural foam is provided, the material either having been formed in situ or having been precut or preformed, placed in the space within the panels and frame and bonded to at least the panels 1, 2.

To assemble the preferred embodiment of the door, the frame elements 4a are first cut to size depending on the dimensions of the panels 1 and

2, which are determined in accordance with the overall door dimensions required. The frame elements 4a are then assembled together, an adhesive or a solvent is applied to the surfaces 6 of the recesses, a sealant is applied to the surfaces 7, and the panels 1, 2 are placed in the recesses. The assembly is then compressed to bond the frame to the panels. Whilst the assembly is being compressed, foam material, e.g. polyurethane foam, is injected through holes made in the frame, e.g. in the channel 15, into the space within the frame and panels. The material foams in situ under high pressure and assists in creating a door of high structural rigidity. The interior faces of the panels may be contoured or roughened to increase bonding between the foam material and panels.

In a modification, instead of creating the foam in situ, a precut or formed block or sheet of structural foam material may be used and placed between the panels during assembly of the door. The block or sheet may be adhered or otherwise bonded to the panels.

In a modification shown in Figure 3, one or, as shown, each recess 5 is provided with a flange 9 which overlies the exterior face of the panel so that the panel is positively retained by the frame. With this arrangement, the frame elements 4a have to be assembled around the or each panel.

As shown in Figure 1, the frame 4 includes a projection 10 with a laterally facing groove 11 for receiving a compressible seal which, in use of the door, seals against the frame for the door when the door is closed. For less exposed doors, e.g. interior doors, a seal may not be required and the frame 4 of the door may then have the configuration shown in Figure 4, with the projection 10 omitted.

The frame 4 is, as shown, hollow and the interior of the frame may be provided with a variety of different flanges or walls depending on the fittings, e.g. locks or hinge, required for the function the door is to perform. For example, if the door is provided with one or more locks, the or each lock may extend within

the frame 4 and the frame may be provided with flanges to assist in retaining the lock in place. Equally, the door will be provided with hinges which can be mounted on or in the frame 4. A reinforcing plate or strip, e.g. of metal or plastics material, may be provided adjacent the interior of the frame in the region of the fitting to strengthen the flange or wall. Alternatively, the plate or strip may extend along substantially the length of one or more of the frame elements 4a to allow for a variation in the location of the fittings.

CLAIMS:

1. A door comprising a pair of rectangular panels arranged side-by-side to provide the two faces of the door, the panels being spaced apart with a circumjacent frame overlying the free edges of the panels, the space between the panels being filled with a material, the panels being fixed to the frame and the material, and each panel having integral planar edge portions which are designed to be reduced in width prior to assembly with the frame, thereby to enable construction of a variable size of door.
2. A door according to claim 1, wherein the frame defines recesses in which the rectangular panels are received, each recess having a first surface which contacts the inner face of the respective panel and a projecting wall surrounding the first surface to overlie the free edge of the respective panel.
3. A door according to claim 2, wherein the panels are fixed to the respective recesses by a bonding compound.
4. A door according to claim 2 or 3, wherein a seal is provided between the respective projecting wall and the adjacent free edge of the panels.
5. A door according to any one of claims 2 to 4, wherein a flange extends inwardly of projecting wall to overlie the exterior face of the respective panel, thereby to enclose the free edge of said panel.
6. A door according to any one of the preceding claims, wherein the edge portions are approximately 50 mm in width.

7. A door according to any one of the preceding claims wherein the panels are constructed of a synthetic material.
8. A door according to any one of the preceding claims, wherein the frame comprises frame elements extending along the four side edges of panels, the frame elements having a uniform cross section.
9. A door according to any one of the preceding claims, wherein the interior faces of the panels are configured to increase adhesion between the panels and the material.
10. A door according to any one of the preceding claims, wherein the material is a foam material.
11. A door substantially as herein described with reference to the accompanying drawings.



Application No: GB 9714033.9
Claims searched: 1-11

Examiner: Paul Foot
Date of search: 29 September 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): E1J: JGS, JGL, JGX, JM, JHX, JXX

Int CI (Ed.6): E06B: 3/70, 3/72, 3/74, 3/76, 3/78, 3/82, 3/84, 3/86, 3/88

Other: Online: World Patents Index

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB2289700A (MING-HSIN WU) Esp. Figs. 1-3	1-4, 7, 8
X	GB1406235A (BENDIX HOME SYSTEMS LTD.) Whole document relevant	1, 2, 5, 8, 10
X	GB0907088A (ALDO GALANTE) Esp. Figs. 9-12	1-3, 8
X	EP0726381A1 (QUISTEN LIMITED) Esp. Figs. 1, 3, 11	1-5, 7, 8
X	EP0074623A2 (ZWICK ET AL.) Esp. Figs. 3, 4	1, 5, 10
X	WO94/27021A1 (ALAN ECKEL) Esp. Figs. 1-3, 11	1, 2, 7, 8, 10
X	US4752517A (BEITEL) Esp. Figs. 3, 4	1, 3, 5, 7, 8, 10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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